

1 **What is claimed is:**

2 1. A USB system for data communication between a processor and
3 IDE devices, comprising:
4 a plurality of IDE devices;
5 a plurality of USB-to-IDE bridges, wherein each IDE device is
6 connected to a respective USB-to-IDE bridge; and
7 a USB controller, wherein the USB-to-IDE bridges are connected to
8 the USB controller, whereby the processor can communicate with the IDE
9 devices via the USB controller.

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11 2. The system of claim 1, wherein at least one of the IDE devices
12 comprises a hard disk drive.

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15 3. The system of claim 1, further comprising one or more USB hubs,
16 each USB hub connected between two or more USB-to-IDE bridges and a USB
17 controller.

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19 4. The system of claim 1, wherein each IDE device can be utilized in
20 hot plugging.

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22 5. The system of claim 1, wherein one or more IDE devices can be
23 disconnected from the system while the system is operating.

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25 6. The system of claim 1, wherein at least one additional IDE device
26 coupled to a corresponding USB-to-IDE bridge can be connected to the USB
27 controller while the system is operating.

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29 7. The system of claim 1, further comprising at least one USB hub
30 connected between a number of the USB-to-IDE bridges and one of the USB

1 controllers, whereby the processor can communicate with the IDE devices via the
2 USB controller and the USB hub.

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4 8. The system of claim 7, wherein one or more IDE devices can be
5 disconnected from the system while the system is operating.

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7 9. The system of claim 1, wherein at least one additional IDE device
8 coupled to a corresponding USB-to-IDE bridge can be connected to the hub
9 while the system is operating.

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11 10. A method for connecting multiple IDE devices to a processor for
12 data communication, comprising the steps of:
13 providing multiple USB-to-IDE bridges;
14 connecting each IDE device to a respective one of the USB-to-IDE
15 bridges;
16 providing a USB controller; and
17 connecting the USB-to-IDE bridges to the USB controller, whereby the
18 processor can communicate with the IDE devices via the USB controller.

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20 11. The method of claim 10, wherein at least one of the IDE devices
21 comprises a disk drive.

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23 12. The method of claim 10, further comprising the steps of hot
24 plugging one or more IDE devices to the USB-to-IDE bridges.

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26 13. The method of claim 10, further comprising the steps of
27 disconnecting one or more of the IDE devices from the system while the system
28 is operating.

1 14. The method of claim 10, further comprising the steps of connecting
2 at least one additional IDE device coupled to a corresponding USB-to-IDE
3 bridge, to the USB controller while the system is operating.

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5 15. The method of claim 10, further comprising the steps of:
6 providing at least one USB hub;
7 connecting each hub to a USB controller; and
8 connecting two or more USB-to-IDE controllers to each hub, such that
9 each hub is connected between a USB controller and two or more USB-to-IDE
10 controllers.

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12 16. The method of claim 15, further comprising the steps of
13 disconnecting one or more of the IDE devices from the system while the system
14 is operating.

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16 17. The method of claim 15, further comprising the steps of connecting
17 at least one additional IDE device coupled to a corresponding USB-to-IDE
18 bridge, to one of the hubs while the system is operating.

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20 18. A data storage system, comprising:
21 a plurality of IDE storage devices;
22 a plurality of USB-to-IDE bridges, wherein each IDE storage device
23 is connected to a respective USB-to-IDE bridge; and
24 a USB controller, wherein the USB-to-IDE bridges are connected to
25 the USB controller, whereby the processor can communicate with the IDE
26 storage devices via the USB controller.

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28 19. The data storage system of claim 18, further comprising a carrier
29 for each IDE data storage device, such that each IDE disk drive and
30 corresponding USB-to-IDE bridge are stored in the respective carrier.

1 20. The data storage system of claim 18, wherein one or more IDE
2 storage devices can be disconnected from the system while the system is
3 operating.

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5 21. The data storage system of claim 18, wherein at least one
6 additional IDE disk device coupled to a corresponding USB-to-IDE bridge can be
7 connected to the USB controller while the system is operating.

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9 22. The data storage system of claim 18, further comprising at least
10 one USB hub connected between a number of the USB-to-IDE bridges and one
11 of the USB controllers, whereby the processor can communicate with the IDE
12 devices via the USB controller and the USB hub.

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14 23. The data storage system of claim 18, further comprising one or
15 more USB hubs, each USB hub connected between two or more USB-to-IDE
16 bridges and a USB controller.

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18 24. The data storage system of claim 23, wherein at least one or more
19 IDE storage devices can be disconnected from the system while the system is
20 operating.

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22 25. The data storage system of claim 23, wherein at least one
23 additional IDE storage device coupled to a corresponding USB-to-IDE bridge
24 can be connected to one of the USB hubs while the system is operating.

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26 26. The data storage system of claim 23, wherein at least one
27 additional IDE storage device coupled to a corresponding USB-to-IDE bridge and
28 associated hub, can be connected to the USB controller while the system is
29 operating.

1 27. The data storage system of claim 23, wherein at least one IDE
2 storage device coupled to a corresponding USB-to-IDE bridge and associated
3 hub, can be disconnected to the USB controller while the system is operating.
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